Detailed Action

Response to Amendment

1. Applicant's Remarks/Arguments filed on 12/12/2008 regarding claims 2-18 have been fully considered. Claim 1 has been cancelled by applicant. Claims 2-18 are currently pending.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with applicant's representative, Mr. Khaled Shami, on 1/23/2009.

The application has been amended for claims 6, 7, 8 as follows:

6.(Currently Amended) ~~The apparatus~~ The subsystem of claim 5 further comprising a cable modem termination means having one or more downstream transmitter line cards each containing a DOCSIS transmitter having an output coupled to said downstream mapper means, and a timestamp counter means for supplying synchronized timestamp counts to every downstream transmitter line card in a group of downstreams which will share an upstream, and having one or more upstream receiver line cards each having a DOCSIS upstream receiver having a radio frequency input coupled to said upstream mapper mean, said cable modem termination means including a switch fabric means for routing packets between said line cards, a storage/cache circuit, a forwarder/application circuit and ports for coupling to a wide area network and local content servers, said cable modem termination means for serving as the headend of a hybrid fiber coaxial cable system coupled via one or more optical nodes to a plurality of cable modems and for:

1) creating DOC SIS downstreams and upstreams;

2) implementing a flexible mapping between said downstreams and said optical nodes;

3) mapping one or more downstreams to a shared upstream receiver and generating and sending suitable downstream DOCSIS messages to implement said mapping;

4) implementing a flexible mapping of optical nodes to upstream receivers;

5) carrying out load balancing and communication parameter monitoring so as to create new upstreams and downstreams with channel parameters and burst profiles as needed to meet load balancing considerations or resolve problems some cable modems may be having in communicating with said cable modem termination means.

7. (Currently Amended) ~~The apparatus~~ The subsystem of claim 5 further comprising a cable modem termination system having one or more downstream transmitter line cards each containing a DOCSIS transmitter having an output coupled to said downstream mapper means, and a timestamp counter means for supplying synchronized timestamp counts to every downstream transmitter line card in a group of downstreams which will share an upstream, and wherein each downstream transmitter line card includes a computer or state machine programmed or structured to implement a downstream media access control (DMAC) process, and having one or more upstream receiver line cards each having a DOCSIS upstream receiver having a radio frequency input coupled to said upstream mapper mean, and wherein each upstream receiver line card includes a computer or state machine programmed or structured to implement an upstream media access control (UMAC) process, said cable modem termination system including a switch fabric coupled to and serving to route packets between said line cards, a storage/cache circuit, a forwarder/application circuit and ports for coupling to a wide area network and local content servers, said cable modem termination system functioning to serve as the headend of a hybrid fiber coaxial cable system coi-pled via one or more optical nodes to a plurality of cable modems, and wherein said UMAC and DMAC processes, said DOCSIS transmitters and receivers and said switch fabric and said upstream and downstream mapper means cooperate to implement the following functions:

1) creating DOCSIS downstreams and upstreams;

2) implementing a flexible mapping between said downstreams and said optical nodes;

3) mapping one or more downstreams to a shared upstream receiver, and generating and sending suitable downstream DOCSIS messages to implement said mapping;

4) implementing a flexible mapping of optical nodes to upstream receivers;

5) carrying out load balancing so as to create new upstreams and downstreams with channel parameters and burst profiles as needed to meet load balancing considerations;

6) generating and sending suitable switch control commands to said upstream and/or downstream mappers as needed to change said upstream and/or downstream mappings as needed, and generating and sending suitable DOCSIS downstream messages to cause selected cable modems to switch to said new upstreams and/or downstreams as needed to meet said load balancing considerations.

8. (Currently Amended) ~~The process~~ The subsystem of claim 7 wherein step 5 further comprises also detecting conditions which may be causing problems in cable modems communicating with said cable modem termination system and creating new upstreams and/or downstreams with channel parameters and burst profiles as needed to resolve problems some cable modems may be having in communicating with said cable modem termination system, and wherein step 6 further comprises generating and sending suitable switch control commands to said upstream and/or downstream mappers as needed to change said upstream and/or downstream mappings as needed to resolve problems some cable modems may be having in communicating with said cable modem termination system, and generating and sending suitable DOCSIS downstream messages to cause selected cable modems to switch to said new upstreams

and/or downstreams as needed to ~~to~~ resolve problems some cable modems may be having in communicating with said cable modem termination system.

EXAMINER'S STATEMENT OF REASONS FOR ALLOWANCE

3. The following is an examiner's statement of reasons for allowance:

The present application relates to providing a subsystem for a cable modem termination apparatus to allow flexible upstream and downstream mapping, including the unique functions of:

"wherein said control circuit is a computer programmed with at least one upstream media access control process (UMAC) and a downstream media access control process (DMAC) for each DOCSIS downstream generated by one of said transmitters, and wherein said computer is programmed by said UMAC and DMAC processes to exchange data between said UMAC process and said DMAC processes to allow a flexible number of downstreams share the same upstream receiver."

The closet prior art, Graham Mobley et al. (US Publication 2003/0053493), discloses a DOCSIS system that comprises a downstream interface and an upstream interface that couples to a HFC network, and a control interface coupled to a combiner and a splitter for generating electrical signals which are associated with customers. However, Graham Mobley fails to anticipate or render obvious the above quoted limitations of the present application. This renders the claims allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 571-272-3141. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. M./
Examiner, Art Unit 2416

/Chi H Pham/
Supervisory Patent Examiner, Art Unit 2416
1/30/09